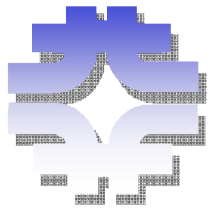
Beam Instrumentation Summary

A. Ratti

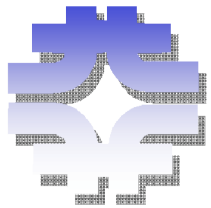
for the beam instrumentation group



A Novel Approach

- Will not regurgitate what most in this group heard yesterday

- Focus on highlights:
  - Results and action items
  - Problems, issues and concerns
  - Lessons learned

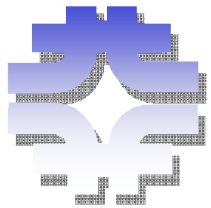


Luminosity Monitor

- Successful LARP review on April 11
- Demonstrated 40 MHz operation
- Ready for a test at RHIC
- Final design started

Open Items:

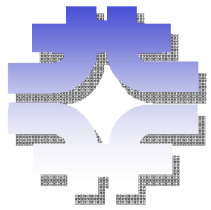
- Rad hard qualification
  - Possibility at p-bar target in Tevatron



Tune Feedback

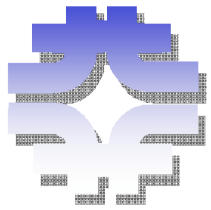
- Progress at RHIC
  - Good results with coupling measurements and correction
  - Improved performance against 60 Hz harmonics
  - Have bench setup available for system development

- Plan for RHIC turn on with tune and coupling feedback
  - CERN representatives (Rhodri and Marek) will be participating at BNL



Schottky Monitor

- The activity is now funded so the work can start
- Rough planning is in place
  - Ralph's visit in November will help finalize plans
- Recent results from the Tevatron showed successful daily operation to monitor and correct p-bar tunes
- The work at the Tevatron will continue to feed the design of the LHC monitor

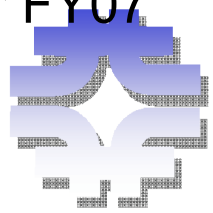


New Initiatives

- Head-Tail monitor
  - Used at Tevatron
  - Possible improvements with diode detection under study
- ZDC
  - Proposed by experimenters for ATLAS
  - Based upon RHIC experience
- AC Dipole

- Sych light based diagnostics
  - Opens a lot of possibilities

- Process requests by the next collaboration meeting, in time for FY07 funding

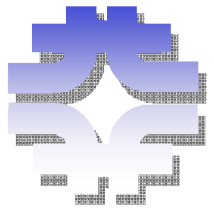


Issues - Funding

From the Lehman review:

"*While the instrumentation items are a small part of the overall program, they are well-chosen and seem to be adequately supported at present. There was a sense, however, that the instrumentation activities might be squeezed out by excessive demands from other parts of the LARP program (magnets and/or commissioning). LARP management must guard against this happening, as these devices form an entry for the U.S. team into the arena of beam commissioning. "*

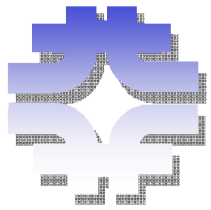
The squeeze happened to the Tune Feedback activity - a formal request for correction will be made shortly



Issues - DAQ

- Integration with DAB-IV board is still at planning phase
- The boards have not arrived in the US yet
- Development time is uncertain
- Each task has backup solutions
  - Not ideal for CERN

We are planning a dedicated meeting to address the issue and expedite integration and knowledge transfer



Issues - Schedule

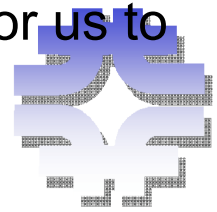
- Important issue from the Lehman review:

"The bunch-by-bunch luminosity monitor and the tune monitor are particularly important to successful LHC operation and its further development, and should be viewed as efforts with true "deliverables", as opposed to being items to be delivered as the product of "best effort".

- LHC schedule is a driver for our deliverables

- Both Lumi and TF are expected to be ready for first beam in LHC
  - Strong interest at CERN to have a Schottky monitor too

- The current LHC schedule makes it challenging but feasible for us to deliver our devices on time



Issues - Integration at CERN

- Common issue for all tasks
- Working with CERN points of contact to prepare EDMS documents
- Control system integration is one of the least developed areas

Conclusions

- Good progress with all systems
  - We welcome the Schottky monitor activity
- With the deadline approaching we all plan to tighten up schedules and deliverables
- Integration efforts are increasing
- CERN is well integrated and contributing